REMARKS/ARGUMENTS

Drawings

ITEM 1

In response to the Final Office Action, Applicants submit amendments to Figs 1 and 3. The "REPLACEMENT SHEETS" and "ANNOTATED SHEETS SHOWING CHANGES" are at the end of this reply. Applicants assert that the text does not add new matter and that the language is consistent with the text in the written description that describes the figures.

Claim Rejections – 35 USC 103:

Each claim in the application stands rejected under 35 U.S.C. §103 as being unpatentable over U.S. Pat. No. 6,803,902 to Janssen et al. ("*Janssen*") in view of U.S. Pat. No. 6,950,088 to Dalal ("*Dalal*") and in further view of U.S. Pat. No. 6,952,241 to Ouchi et al. ("*Ouchi*").

Applicants propose amending claim 1 in a manner that Applicants believe does not change the protective scope of claim 1, but rather more clearly characterizes the invention and places the claims in better condition for allowance and/or appeal.

In the following text, Applicants point out that the combined features in the cited references do not disclose, teach, nor suggest the combination of features in Applicants' claimed invention. Further, Applicants point out the cited references do not provide enough information in their disclosures to provide one skilled in the art with enough direction to adjust the features in the cited references to arrive at the combination of features in Applicants' invention or to predict an improvement to the systems.

In short, the claimed invention provides direct or "a posteriori" (in real time) identification and measurement of the color of light received at each and the same row such that

the writing of the pixels of the light valves are done with the true identified illumination color and known intensity.

Claim 1 recites an image projection system having the following combination of features:

a light valve comprising a pixel matrix array disposed in rows and columns on a substrate forming an active matrix,

an illumination system for moving bands of different colored light over the light valve, perpendicularly to the rows,

means for identifying the illumination color of each row of pixels of the light valve,

means of managing video data of said images for controlling the writing of the pixels of the light valve,

means of synchronizing the video data sent to each row of pixels of the light valve according to the illumination color of the row identified by the identification means,

wherein the identification means comprises at least one photosensitive sensor level with each row of pixels of the light valve, each sensor of a row being designed to identify **directly** (see specification at page 7, lines 19-27, the expression "directly" more clearly points out that the identification means is actually identifying the illumination color) the illumination color **of that row** and to measure the illumination intensity of that row (see specification at page 7, lines 29-37, the expression "of that row" emphasizes what is implied by the claim language "each sensor of a row," which is every row gets identified), and

wherein the measurement of the illumination intensity is used in the means of managing video data to adjust the video data **and the colors of said images** (per specification at page 17, lines 26-30, the expression "the colors of said images" more clearly points out that the video data has image data as implied in the "managing video data" means in claim 1 and that the image data

has color content information as implied in the "synchronizing" means in claim 1) for controlling the writing of said pixels.

Janssen discloses an image projection system comprising:

-a light valve comprising a pixel matrix array disposed in rows and columns on a substrate forming an active matrix (Fig.3),

-an illumination system for moving bands of different colored light over the light valve, perpendicularly to said rows (Column 2, lines 32-37),

-means of managing video data of said images for controlling the writing of said pixels of the light valve (Column 2, line 33-40), and

-means of synchronizing the video data sent to each row of pixels of the light valve according to the illumination color (column 1, lines 41-43).

In the office action, it is admitted that Janssen does not disclose:

-a photosensitive sensor level to each row,

-the use of the sensor of each row to measure the illumination intensity of that row,

-use of an illumination intensity measurement by the means of managing video data to adjust the video data and the colors of the images for controlling the writing of said pixels.

Moreover, the applicant considers that Janssen does not disclose the identification of the illumination color of each row and a photosensitive sensor at each row.

The Office Action, however, uses Dalal to overcome some of the deficiencies in Janssen. Particularly it is stated in the Office Action that Dalal discloses:

the identification means that comprises "arrays of photosensors adjacent to the rows of display elements with each sensor being disposed level with a row of pixels of the light valve," and

"the sensors being designed to identify the illumination color of the rows."

In Dalal, Applicants point out that the problem to overcome is the propensity for "inter-color mixing artifacts" that occur due to mismatch of the electrical scan (which is the electrical signal that activates each of the rows, one after the other) and the optical scan (which is the leading edge of a band of color light that impinges each of the rows, one after the other). (col. 1, lines 32-64) To overcome this problem, Dalal discloses a "method of establishing a delay of at least a minimum duration between the electrical addressing of the panel locations with the data for the next color stripe to be scrolled across the panel and the leading edge of that color stripe impinging upon the addressed location," (col. 1, line 65- col. 2, line 5) wherein delays that are at least 2.5 ms are targeted and achieved by using three arrays of photosensors. (col. 2, line 9-12)

Dalal, however, does not precisely reveal how many photosensors are used and does not reveal the exact lateral positioning of the photosensors along the vertical strips 18, 20, and 22, but does show where there are some photosensors in Fig. 3, which shows the screen. Fig. 3 indicates that the shaded vertical strips 18, 20, and 22 are exposed to the blue 36, red 24, and green 32 stripes of light, respectively. (col. 4, lines 42-51)

Nevertheless, the Abstract in Dalal makes it clear that the sensors are used to provide "an indication of the positions of the leading and trailing edges of each color stripe at each instant, and thus the instantaneous velocity of each stripe." As such, the simplest and most practical indication of determining the velocity of each stripe and providing "an indication of the positions of the leading and trailing edge" would be to actually measure the time interval that it takes for the leading edge of a strip to travel from one photosensor at one known position to another photosensor at another known position and actually measure the time interval that it takes for the trailing edge of a strip to travel from one photosensor at one known position to another photosensor at another known position.

However, to employ this technique in Dalal of obtaining "an indication of positions" and velocity, it is not necessary at all to have a photosensor implemented at each row. In fact, based on the objective of the disclosure of Dalal it is not necessary to have very many photosensors.

Display resolution around the time of the filing of Dalal (i.e. 2002) for 15 inch (~12 inch horizontal dimension and 9 inch vertical dimension) LCD computer displays were known to be from 67 to 204 pixels per inch in the horizontal and vertical dimensions. (http://en.wikipedia.org/wiki/Pixels_per_inch) For such displays, the 67 pixel per inch LCD screen would have 67x9 = 603 horizontal rows. LCD screens were known to operate at 60 frames per sec in which the drive speed corresponds to around 16.7 msec (for full scan time). (per [0040] in US20010035922) From this above-mentioned general reference information and inspection of Fig. 4 in Dalal, which shows a horizontal axis being 18 ms which corresponds well to 16.7 msec (full scan time), in US20010035922, the horizontal axis in Fig. 4 in Dalal reflects the complete scan across the entire screen. As such, without more information, one skilled in the art with knowledge of Dalal and reviewing the Fig. 4 would consider that the data in Fig. 4 would reflect LCD product known to be on the market at the time that Dalal was filed, which was in 2002. It would be reasonable for those skilled in the art to consider the product in Fig. 4 to have at least 603 horizontal rows. If the product in Fig. 4 has at least 603 horizontal rows, one skilled in the art would not consider incorporating a photosensor for each color at each row, because the number of data points needed to generate the data in Fig. 4 is significantly less than 603 per color. More importantly, the number of data points needed to confidently achieve the stated goal of having "an indication of the positions of the leading and trailing edges," (per Abstract) to ensure "a delay of at least a minimum duration between the electrical addressing of the panel locations with the data for the next color stripe to be scrolled across the panel and the leading edge of that color stripe impinging upon the addressed location," (col. 1, line 65- col. 2, line 5) must be commensurate with a key stated goal of having delays between leading and trailing edges being at least 2.5 ms. (col. 2, line 9-12) For support of this point, Applicants show Fig. 4 immediately below and will point out that substantially less than 603 data points (which would correspond to one data point per scan line) would be necessary to construct any one of the curves in Fig. 4.

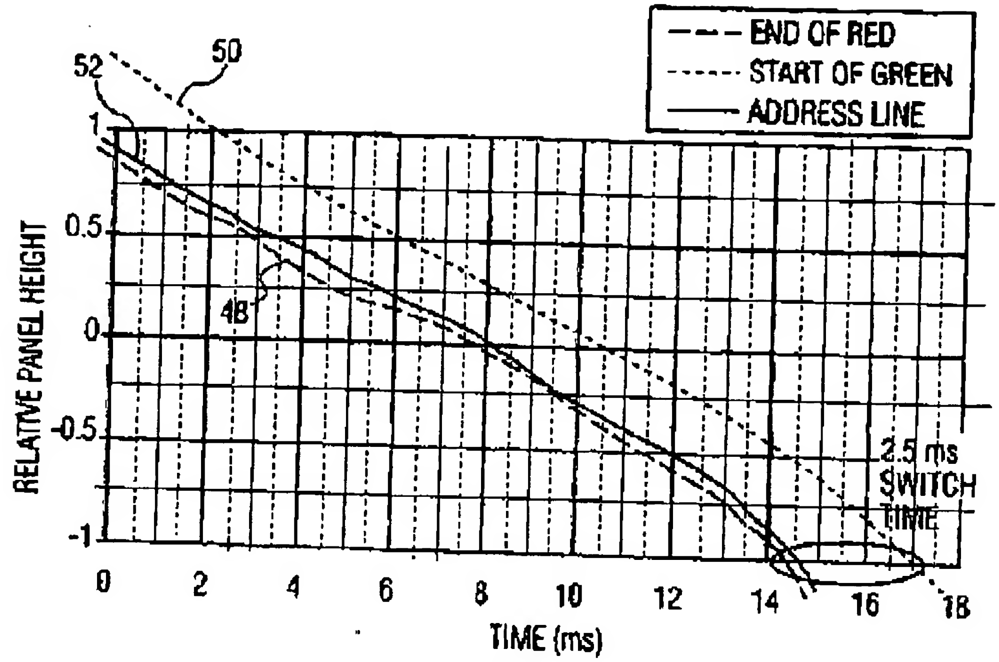
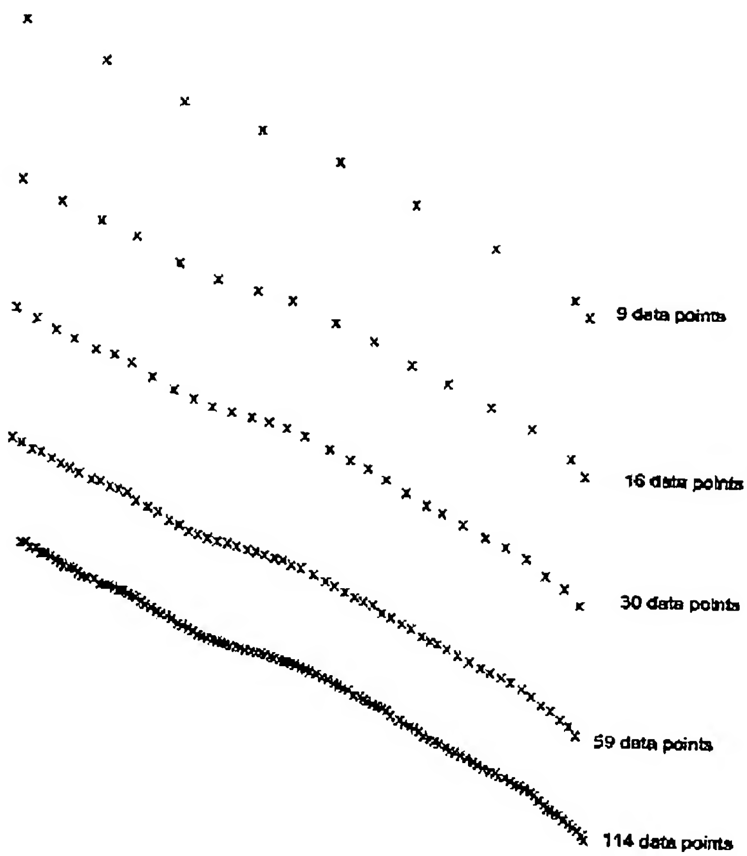


FIG. 4

Specifically, Applicant shows in the following drawing a reproduction of curve 48 using various different numbers of possible locations corresponding to ~9, ~16, ~30, ~59, and ~114 data points.



From this visual demonstration, one can see that merely having 30 data points is more than sufficient enough to map out a complete curve corresponding to an indication of the position of the leading a trailing edges. This can be seen in the next reproduction of Fig. 4 with the 30 data points superimposed on curve 48.

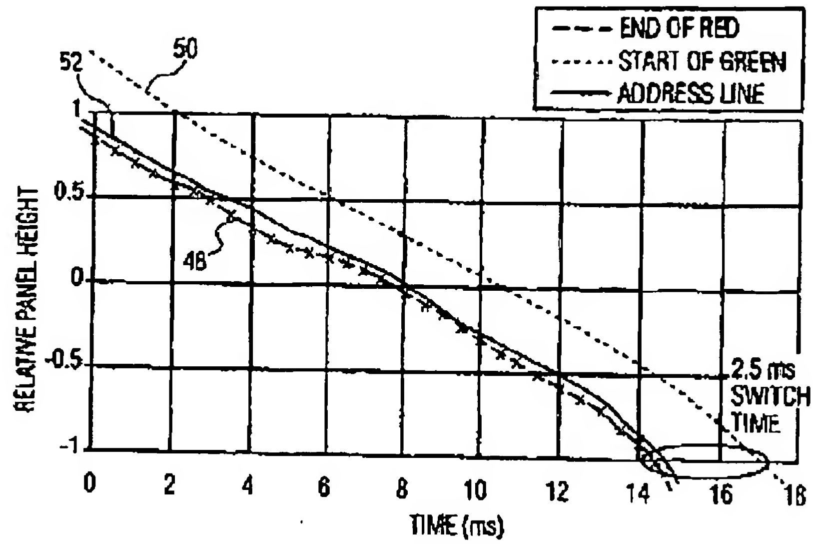


FIG. 4

Here, if one were to perform elementary curve fitting of the 30 data points, curve 48 would substantially be created. Hence, it would not be necessary have 603 data points or sensors at every row, because it would be overkill or extremely excessive for the purpose of ensuring a 2.5 ms separation is maintained between adjacent leading and trailing edges.

The office action cited St. Regis Paper. v. Bermis Co. (193 USQP 8) to support its statement that "It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide at least one sensor per row and align the sensor with the row, since it has been held that mere duplication of the essential working parts of a device involve only routine skill in the art." However, St. Regis Paper. v. Bermis Co. (193 USQP 8 at 11) states that

> "the Supreme Court has recently indicated that section 103 cannot easily be satisfied by inventions that rearrange old elements in new combinations with each element performing the same function it performed in the prior art, even though the new combination produces a more striking result than the old ones. Sakraida v. Ag Pro, Inc., 425 U.S. 273, 282, 189 USPQ 449, 452-453 (1976). Unless the combination is

"synergistic, that is, 'result[ing] in an effect greater than the sum of the several effects taken separately,"' it cannot be patented. Id., citing Anderson's -- Black Rock v. Pavement Co., 396 U.S. 57, 61, 163 USPQ 673, 674-675 (1969)."

Applicants point out that by having the photosensors at each row as claimed that, there is a synergistic effect greater than the sum of the several effects taken separately to meet the standard of patentability. The synergistic effect is that by having the photosensors positioned and operating at each row that at each instant in time the system can know not only where the leading and trailing edges are, but further know the intensity value distribution and color of the bands. This is much more than just knowing the location of leading and trailing edges and can in fact be used to manage video data to define the writing of the pixels to correctly restore the original colors of the image in a direct and precise fashion which cannot be accomplished when photosensors are not used at each row. With such use of photosensors, aberrations (such intensity spikes or drifts) occurring within a pixel row can be precisely detected and compensated.

Further in support of the rejection, it is stated that according to In re Japikse (86 QSPQ 70) "that rearranging parts of an invention involves only routine skill in the art." In response Applicants first disagree that having each sensor of a row being designed to identify the illumination color of that row and to measure the illumination intensity of that row is a rearranging of parts, because there is no rearranging of parts due to the fact that the references do not have sensors that measure color and intensity at all rows, and as such, any rearrangement of their parts would not constitute having sensors at each row. Regardless of Applicants' comment on rearranging parts, Applicants further point out that MPEP 2144.04 (the section which discusses the precedence of In re Japikse) further goes on to state that:

"The mere fact that a worker in the art could rearrange the parts of the reference device to meet the terms of the claims on appeal is not by itself sufficient to support a finding of obviousness. The prior art must provide a motivation or reason for the worker in the art, without the benefit of appellant's specification, to make the necessary changes in the reference device." Ex parte Chicago Rawhide Mfg. Co., 223 USPQ 351, 353 (Bd. Pat. App. & Inter. 1984)."

From this statement in the MPEP, Applicants believe that claim 1 is patentable because the cited prior art does not "provide motivation or reason" for having sensors placed at each row to identify color and intensity.

In the office action, to overcome the asserted deficiency in Janssen and Dalal of not expressly having sensors at each pixel row to measure illumination intensity at each row of pixels and using the intensity values as a means to manage and adjust video data for controlling the writing of pixels, Ouchi is used.

Ouchi et al. (US 6,952,241) discloses an image projection system comprising:

- a light valve comprising a pixel matrix array disposed in rows and columns on a substrate forming an active matrix (Ouchi Fig. 1-15, ref. 12a, 12b or 12c),
- an illumination system (Ouchi at Fig. 1-15, ref. 19) for moving bands of different colored light over the light valve, perpendicularly to said rows (Ouchi at column 8, lines 43-59, sixth embodiment, "scrolling method"),
- means of managing video data of said images for controlling the writing of said pixels of the light valve based on video signal which is externally inputted (col. 6, lines 10-13), and
- a means for synchronizing color illumination (Fig. 24; col. 24, line 28 – col.25, line 8),
- a photosensitive sensor (ref. 329) designed to measure the illumination intensity of the light valve (col.24, lines 62-66).

The office action points out that Ouchi (col.24, line 63 – col.25, line 5) states:

"[a] light amount sensor 329 measures the amount of light, associated with the change of the lamp 324 and the light valve element 345 and the change of a filter when time passes. An output from the light amount sensor 329 is **inputted to the timing control circuit 332**. The timing control circuit 332 **controls** the overall circuits of the characteristics extracting circuit 328, the frame rate converting circuit 325, the RGB plane sequential signal processing circuit 326, and the light valve drive circuit 327, and the like, **based on inputs of** the GUI 331, the characteristics extracting circuit 328, and **the optical sensor 329**, thereby switching the optical characteristics switching element 344."

In sum, according to this excerpt of Ouchi and to fig. 24, Ouchi discloses that the photosensitive sensor (ref. 329) measures the illumination intensity of the light valve; then, this

measurement is inputted to a timing control circuit 332. Then, the timing control circuit 332 controls the means of managing video data (ref. 325, 326, 327). As the measurement of the illumination intensity of Ouchi is used in the means of managing video data via a timing control circuit 332, this measurement can only be used to synchronize the video data and control the writing of pixels, not to adjust the video data and the colors of the images for controlling the writing of said pixels as claimed in the invention. Further, Ouchi does not adjust color levels to correctly restore original color of the images (i.e., Ouchi does not disclose that the measurement of the illumination intensity is used in the means of managing video data to adjust the video data for controlling the writing of said pixels), but only uses the measurements for synchronization purposes, since the "output from the light amount sensor is (only) inputted to the timing control circuit. " (Ouchi, fig. 24 and column 24, lines 65-66). Consequently, even if Ouchi discloses using a graphic user interface (GUI) in the means of managing video data (ref. 325, 326, 327) to adjust the video data and the colors of the images for controlling the writing of the pixels which can be changing the color temperature (col.24, lines 50-55), Ouchi does not disclose using specifically measurements of the illumination intensity in the means of managing video data to adjust the video data and the colors of the images for controlling the writing of pixels. Therefore, Ouchi does not disclose adjusting color levels based on illumination intensity.

In sharp contrast, at page 17, lines 27-39 of Applicants' specification, it is disclosed that "the temporal variation and the level of each of the three signals, red, green and blue, *(of the photosensitive sensors)* are used in the video data generator *(i.e. the means of managing video data)* to synchronize and adjust the video data for the three colors.... The video data generator, using the signal from the photosensitive sensors, best defines the writing of the pixels to correctly restore the original colors of the image." Applicants respectfully point out that synchronization by itself without adjustment could not "correctly restore colors of the image."

Furthermore, at the time of the invention, Ouchi (which only discloses one sensor), Janssen, and Dalal fail to disclose any need or reason for having a sensor along each pixel row.

In sum, Janssen, Dalal and Ouchi do not disclose nor suggest individually nor collectively each of the features in amended claim 1 or the remaining dependent claims 4 and 6. Particularly, none of these prior art documents discloses that each sensor of a row is designed to

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measure the illumination intensity of its row, wherein the measurement of the illumination intensity is used in the means of managing video data to adjust the video data for controlling the writing of said pixels. As such, Applicants assert that the claims are novel and are patentable over the cited references.

In light of the above assertions, Applicants request reconsideration of the rejections and entry of the amendments to the claims.

If the Examiner has any questions or comments that would facilitate the disposition or resolution of the issues, he is respectfully requested to contact the undersigned at 609-734-6816.

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